English Abstract Session

2025年11月15日(土) 13:30 ~ 14:12 第10会場

[E5] English Abstract Session 5 Benign Disease & Early Cancer

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[E5-3] The beneficial effect of plasma jet on hemorrhoids in mice by anti-inflammatory response

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Aim: To overcome hemorrhoids treatments limitations, we explored the effect of plasma jet (He gas) on external hemorrhoids. Methods: C57 black male mice, 6 to 8 weeks, randomly selected, weight and external hemorrhoid model prepared; divided into normal control, positive control, pilex, plasma 30secs, plasma 1min and combined plasma 1min pilex group. Intergroup comparison were performed after induction to study: a. biochemical, hemorrhoidal and histological parameters; b. vascular permeability by Evans blue extravasation. Mice ear edema model was established to study the swelling response and also demonstrated plasma jet effect on pH and in gas and liquid phase. Results: 65 % acetic acid induced hemorrhoids; plasma jet for 30 secs to 1 min showed therapeutic potential; including generation of active particle species ROS in gas and liquid phase such as hydroxyl ions causing inactivation of the bacteria. Secondly, plasma jet 1 min showed significant tissue healing and regeneration similar to the pilex evident by significant reduction of anorectal coefficients, macroscopic severity score, serum TNFalpha and IL6 levels, pain scores, and improved histomorphological scores; combined plasma 1min pilex had superlative effect. The Evans blue extravasation showed significant reduction in vascular permeability and mice ear edema model showed plasma jet was significant in reducing the swelling evident by decreased swelling degree and increased swelling inhibition rate. Conclusion: Plasma jet can significantly promote tissue healing, reduce swelling and inflammatory markers. The treatment process is painless. Therefore, plasma jet can be beneficial for the treatment of external hemorrhoids in mice through antiinflammatory and swelling reduction mechanism.